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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/385,050

08/30/99

PIERONI

K

CHMP-103

MMC2/0625

EXAMINER

GARBER, C

MORLAND C FISCHER
STE 1050
2030 MAIN STREET
IRVINE CA 92614

ART UNIT

PAPER NUMBER

2856

DATE MAILED: 06/25/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/385,050

Applicant(s)

PIERONI ET AL.

Examiner

Charles D. Garber

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 June 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Claims 2-8 recite "said heating element" which lacks antecedent basis in the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pieroni et al. in view of Scott and Gouge.

Regarding claim 1, the Pieroni et al. reference discloses

An apparatus for detecting leaks in a fluid system (title) and a method of its operation (column 3 line 47+) including:

Providing a supply of fluid preferably oil 2 (column 2 lines 50-51) within a sealed chamber (column 1 lines 7-9).

The reference recites "... inlet air will be mixed with the fluid 2 so as to be blown outwardly from air inlet tube 16 and upwardly towards the heating grid 4. As drops of fluid contact the heating grid 4, they will be instantaneously vaporized into smoke 30" (column 4 lines 3-7), equivalent to heating at least some of the oil so that said oil is vaporized into smoke as in the instant invention.

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The reference further recites "... the smoke 30 will be delivered to smoke supply conduit 20 by air outlet tube 14. As the smoke reaches the fluid system to be tested, any leak therein will allow some of the smoke to escape." (column 4 lines 12-15), equivalent to delivering said smoke carried thereby to the fluid system under test as in the instant invention;

The reference also recites "... a visible detection of escaping smoke will provide a quick and easy indication of the presence and location of the leak" (column 4 lines 15-16) equivalent to said smoke exiting a leak in the fluid system as in the instant invention.

The Pieroni et al. reference however does not teach adding a fluorescent dye to the oil and using the smoke generated from the oil as a carrier for said fluorescent dye; wherein said fluorescent dye will leave a fluorescent trace around the leak; and shining ultraviolet light on the system under test to illuminate the trace left by the fluorescent dye around the leak.

Scott discloses a fog and/or smoke generating device for performing smoke tests revealing leaks in sewers, pipes or boilers and similar conduits or containers (column 1 lines 5-35). The invention of Scott includes a thermal-aerosol generator that creates smoke by injecting an atomized hydrocarbon liquid or oil mixture into a hot gas stream to cause vaporization by heating (column 3 lines 5-9). The resulting smoke is then mixed with ambient air to cool the smoke.

Scott recites " The hydrocarbon liquid may also include a residual or visible coloring material, such as a fluorescent material, or may contain other colored, coloring and/or residue and/or non-residual color producing materials to aid in locating the

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openings. Detection of fluorescent materials may include the use of ultraviolet or black light " (column 3 lines 40-46) teaching the mixture of oil and fluorescent dye as in the instant invention.

Scott also recites "The hydrocarbon [sic] liquid within container 55 may, if desired, include a coloring material which is atomized and vaporized with the hydrocarbon, mixed into the flow of ambient air and introduced into the region to aid in observing the fog and/or smoke emanating from the region opening 77. This coloring material may be a fluorescent residual material and/or may be a colored material which may or may not be deposited as a residue near the region openings and the term "fog" is intended to be generic to smokes, fogs, and the like whether colored, fluorescent, residue producing or not" (column 7 lines 14-25)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to mix a fluorescent dye with oil used for producing tracer smoke for leak detection as taught by Scott as it obviously adds another indicator that would improve the probability of detection in the presence of a leak.

The Pieroni et al. reference also lacks a teaching of the system under test being one in which a working gas or liquid is to be transported under pressure (as opposed to gravity for instance).

Gouge discloses a method of smoke testing a heat exchanger of a gas furnace for the presence or absence of leakage or fluid-tight integrity (abstract).

Gouge teaches that heat exchange systems fall into two categories: naturally drawn systems in which hot air rises through a cooler air mass to draw the products of

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combustion at the burner through the heat exchanger and induced flow systems where hot air is blown through the heat exchanger (column 2 lines 12-51). Gouge explains that one aspect of the invention allows for testing heat exchangers under condition similar to the operating condition in which a smoke is introduced into a sealed heat exchanger under a pressure similar to the operating pressure of the heat exchanger (column 4 lines 19-25). This is considered to be equivalent to the system under test being one in which a working gas or liquid is to be transported under pressure. It would have been obvious to one having ordinary skill in the art at the time the invention was made that a fluid system in which a working gas or liquid is to be transported under pressure may be tested using a smoke generator type leak tester. Testing of such systems may advantageously identify leaks which would allow harmful combustion products to enter a living space. (column 1 lines 51-63).

As for claim 2, Pieroni et al. also disclose fluid 2 within chamber 1 and element 4 within (figure 5) equivalent to locating a heating element within said sealed chamber as in the instant invention.

As for claim 3, Pieroni et al. also disclose element 4 above the fluid 2 (figure 5) equivalent to locating said heating element within said chamber above said mixture as in the instant invention.

As for claim 4, Pieroni et al. also disclose arrows shown in figure 5 depicting "The inlet air will be mixed with the fluid 2 so as to be blown outwardly from air inlet tube 16 and upwardly towards the heating grid 4" equivalent to blowing said at least some of

said mixture within said chamber towards said heating element as in the instant invention.

As for claim 5, Pieroni et al. also disclose "Air delivered to the air inlet tube 16 from air pump 25 will draw, by means of suction, some of the supply of fluid 2 into the tube 16 via inlet orifice 18" equivalent to blowing said at least some of said mixture towards said heating element by means of air delivered under pressure to said mixture from an air source as in the instant invention.

As for claim 6, Pieroni et al. also disclose air inlet tube 16, conduit 22, pump 25 shown in figure 5 in an arrangement equivalent to connecting an air inlet tube to said air source, said air inlet tube communicating with said mixture within said chamber to deliver the air under pressure from said air source to said mixture for blowing said at least some of said mixture towards said heating element as in the instant invention.

As for claim 7, Pieroni et al. also disclose orifice 18 in tube 22 as shown in figure 5 and as recited above in discussion of claim 5 above substantively equivalent to air inlet tube has an inlet orifice formed therein and located within said mixture, said air inlet tube extending above said mixture so that said at least some of said mixture is suctioned through said inlet orifice and blown towards said heating element by means of the air under pressure delivered by said air inlet tube as in the instant invention.

As for claim 8, Pieroni et al. also disclose use of air as discussed above. Air is a non-flammable/non-combustible (equivalent terms meaning not ignitable or burnable) gas which is substantively equivalent to blowing said at least some of said mixture towards said heating element by means of a non-combustible gas delivered under

pressure to said mixture from a gas source as in the instant invention. Though air is non-combustible it does contain oxygen an oxidant and Applicant may be intending to claim a gas that is non-oxidizing, non-reacting or inert. However, prior art shows examples of the use of inert carrier gases - see discussion of claim 9 below.

As for claim 10, Pieroni et al. also disclose smoke supply conduit 20 shown in figure 5 connected to the top of the chamber 20 which is equivalent to connecting a smoke outlet line to communicate with said chamber at a location above the mixture so that the smoke produced when said at least some of said mixture is vaporized is conveyed to the system under test via said smoke outlet line as in the instant invention.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pieroni et al. as modified by Scott and Gouge and applied to claim 8 above and further in view of Gouge and Brayman et al.

Pieroni et al. as modified above teach all the limitations as in the instant invention except for expressly teaching the gas is Nitrogen.

Gouge as discussed above discloses a device and method for smoke testing of gas furnace heat exchangers (title) with many of the same limitations as the instant invention including " the generator having: a smoke chamber housing having upper and lower portions; at least one heating element in the upper portion of the smoke chamber housing; a pump which supplies a gas to the smoke chamber housing; a liquid which fills the lower portion of the smoke chamber housing, wherein the at least one heating element is suspended above the liquid; an applicator of liquid to the at least one heating

element; and a smoke vent in the upper portion of the smoke chamber housing" (abstract) " wherein said liquid comprises oil" (claim 4) that teaches the gas is "pressurized carrier gas" (claim 1). Gouge however does not specify a suitable carrier gas.

Brayman et al. disclose an apparatus and method for leak testing automotive wheel rims. Brayman et al. teach "...any of a range of trace gas concentration ... mixed with suitable carrier gas such as air, or nitrogen, as required for the particular application, and the particular trace gas sensor utilized" (column 8 lines 12-16).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to advantageously use a carrier gas to carry smoke from a smoke generator as taught by Gouge and that a suitable carrier gas is air or nitrogen as taught by Brayman et al.

Claim 11 is substantially equivalent to the original claim 9 discussed in the previous office action.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles D. Garber whose telephone number is (703) 308-6062. The examiner can normally be reached on 6:30 am - 4:pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (703) 305-4705. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7725 for regular communications and (703) 308-7725 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-3431.

cdg
June 22, 2001

HELEN KWOK
PRIMARY EXAMINER

